Gas shuttle valve the invention concerns a gas shuttle valve with the characteristics of the generic term of the requirement 1.
With the well-known valves the larger linear extension of the valve is reduced opposite the cylinder head by the fact that a hydraulic play take-up is used.
This is relatively complex, requires additional mobile masses and needs achievement from the hydraulic pump. During electromagnetic valve gear hydraulic valve clearance reconciliation is only partly applicable, since with a larger Unsymetrie from the two reset springs of the magnetic system of the resulting Kraft the Hubarbeit of the magnet is affected unfavorably. In addition the weight of the valve is very important, since it is received directly into the mobile masses and so that considerably to the power absorption of the valve drive contributes.
The task is appropriate for the invention to reason another solution of the problem to create.
This task is solved by the characteristics of the requirement 1.
The requirements 2 and 8 and back the Unteransprüche related to it reveal two somewhat different solution methods of the invention with different training.
Here for Kraft are used the transferring mechanism, in particular for the staff or the pipe materials with smallest thermal expansion. Magnetic materials with high magnetostriction, which decreases with rising temperature, are particularly suitable, from which a volume acceptance results, which compensates a temperature-dependent expansion of the material to a large extent. Thus become with these materials in particular in the temperature range von-30 C to +50 C
Wärmeausdehnungskoeffizienten with low values until down there to 2 x 10-6 k 'reaches.
Materials with high magnetostriction are z. B. Nickel, Eisen-Nickel-sowie iron Kobalt-und iron aluminum alloys.
One is particularly preferentially used under the designation Invar steel well-known Fe-never-alloy with 36% 0.5% nickel portion with the further following values not to be exceeded: C < 0.04%, SI < 0.2%, Mn < 0.4%, P < 0.01% and S < 0,015%.
This alloy exhibits a particularly small thermal expansion with a minimum of approximately 2 x to approximately 200 C 10-6 k '. At expense of the minimum thermal expansion also different nickel portions are possible, whereby when alloys with 30-50% nickel the thermal expansion is smaller than 10 x 10 ' 6 k '. Steel with 4255% nickel exhibits thermal expansions, which are comparable with by glass.
The invention is in particular for electromagnetic valve controls of interest, because in the case of the realization of a hydraulic valve clearance reconciliation problems would result there.
On the basis the design remark examples of the invention are described. Show:
Fig. 1 a first remark example with a Invarstab the Fig. 2 to 4 remark examples with a Invarrohr.

With in Fig. 1 represented remark example is represented a cylinder head 7, in its Gaskanal 8, which works as discharge opening channel, gaseous fuels diverts, as suggested with an arrow 9.
The gas shuttle valve altogether marked with 10 exhibits a valve disk 11, as well as a valve stem 12. The valve disk 11 is directed against a combustion chamber 13. It exhibits a plate part 14, whose edge with 15 is designated. On that Edge 15 rests upon a heat shield 16, preferably a ceramic plate. That heat shield 16 is fastened to the plate part of 14.
The valve stem 12 exhibits a pipe 30.
A first deriving funnel 25, which preferably consists of aluminum plate, includes the pipe 30 with its upper, tapered end. At its lower, extended end the first deriving funnel 25 fastened to the plate part 24 is. The first deriving funnel 25 is to be understood only as option, it can also enffallen. It serves for the better cooling and heat dissipation of the Ventiltellers11.
Importantly in contrast to this a second, outside deriving funnel is 26, which consists of a ceramic material. The second deriving funnel 26 encloses the valve stem 12, D with its upper, tapered end. h. with the represented execution example the pipe 30. The lower, extended end second deriving funnel 26 is connected, for example with the edge 15 of the plate part of 14 by flaring, as suggested with 27.
Since the second Abieittrichter 26 exhibits only a certain wall thickness, remains between him and the pipe 30 and/or. the plate part of 14 and particularly its internal diaphragm 20 an interior 28.
With the remark example of the Fig. 1 is intended inside the pipe 30 a Invarstab 31, the power transmission of the part of 34 on the diaphragm 20 effectuation.
This staff is supported over a ring 35 at the external pipe as break protection. The pipe 30 is only one protective pipe. Between the Invarstab 31 and the pipe 20 sodium 32 is filled in for heat dissipation. Also different alkali metals are possible. The Invarstab shrank both in the part of 34, and the diaphragm 20.
Other connection techniques are conceivable. One recognizes that the pipe is adjustable 30 in relation to the part 34. It contributes nothing to the power transmission and shifts when heating up in relation to the part of 34.
Materials with high magnetostriction as material for the strength-transferring part aligemein, which decreases with rising temperature, are suitable, from which one Volume acceptance results, which compensates a temperature-dependent expansion of the material to a large extent. Materials with high magnetostriction are z. B. Nickel, Eisen-Nickel-sowie Eisen-Kobalt-und iron aluminum alloys.
To be used the above-mentioned Fe-never-alloy with 36%, well-known under the designation Invar steel, can 0.5% nickel portion with the further following values not to be exceeded: C < 0.04%, SI < 0.2%, Mn < 0.4%, P < 0.01% and S < 0,015%.
This alloy exhibits a particularly small thermal expansion with a minimum of approximately 2 x to approximately 200 C 10-6 K-1. It is likewise possible alloys with others nod-blazes also to cobalt portions to begin, whereby thermal expansions are reached smaller than 10 x 10-6 K-1 when alloys with 30-50% nickel. Alloys with 42-55% nickel exhibit thermal expansions, which are comparable with by glass.
With the Ausführungsbeispie! the Fig. the valve is halflaterally cut shown 2. Here the pipe is 40 from Invar or a material with small coefficients of expansion. This pipe 40

is with the part of 41, on that Kraft influences connected, z. B. by weld. At the valve disk 42 a valve funnel 43 is set, a paragraph 44 exhibits and with the valve disk at the edge and centrically connected, for z. B.
Iasergeschweisst is.
The pipe 40 is imported into the funnel 43, supports themselves at the paragraph 44 off and is welded with the funnel 43. The pipe points a break protection in the form of Sicken
45 up. A cut by the pipe within the range of the Sicken shows Fig. 2a. In Fig. a possible external pipe is not drawn 2 in to the protection. The pipe can be arranged by this break protection very thin-walled with small weight.
In Fig. 3 is shown the stops of the lower part of the valve. The pipe is with 50, that Funnel with 53, the valve disk with 52 marks. Here the funnel is 53 by boron delungen at the edge and centrically with the valve disk 52 connected, possibly with 56 still shrunk. The connection of the pipe 50 with the funnel can be realized by the fact that a section 57 of the funnel is fine-worked on. (turned, polished) and that the pipe within this range, which exhibits a small paragraph because of the finishing shrank. The inside of the pipe 50 and if necessary also the funnel is filled with sodium 59. Also different alkali metals can be used here. Here also still another external pipe 58 (protective pipe) is intended. Also here Sicken can be intended as break protection in the interior pipe.
The remark example of the Fig. to a large extent to that the Fig corresponds to 4. 3. Here the funnel 63 is welded with 67 with the valve disk. Also the pipe 60 is welded with 68 with the funnel 63; and finally the external pipe is welded with 69 with the funnel. Here a Sicke 65 is visible. The Sicken rise up with the intake valve into the valve guide inside, with the exhaust valve to to the valve guide near. With a solution with additional internal pressure in the cylinder housing the exhaust valve can be arranged like the intake valve.